

Effectiveness of hypnotherapy as complementary intervention in reducing post-cesarean pain: A PRISMA-based systematic review of literature released during the 2015-2024 period

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ABSTRACT

Cesarean section is a common surgical procedure often associated with moderate to severe postoperative pain. Hypnotherapy has been proposed as a complementary, non-pharmacological intervention; however, evidence specific to post-cesarean pain management remains limited. The purpose of this PRISMA-based systematic review was to evaluate hypnotherapy as an intervention for reducing postoperative pain associated with cesarean section. Literature searches were conducted in Google Scholar and PubMed for studies published between 2015 and 2024 using predefined inclusion and exclusion criteria. From 326 identified records, four studies met all eligibility criteria and were included in the qualitative synthesis. Despite heterogeneity in study design and intervention protocols, all included studies consistently reported reductions in postoperative pain intensity among participants receiving hypnotherapy compared with standard postoperative care, with pain outcomes primarily measured using validated scales such as the Numerical Rating Scale. These findings suggest that hypnotherapy may support conventional analgesic strategies as an adjunctive intervention during early postoperative recovery. Nevertheless, the scarcity of existing research and the presence of methodological limitations suggest the need for rigorously designed randomized controlled trials to provide more robust evidence.

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1. INTRODUCTION

Cesarean section (CS) constitutes a major obstetric surgical intervention internationally with its utilization exhibiting a sustained upward trend over the past three decades [1]-[3]. Global estimates indicate that cesarean section rates have increased from around 7% in 1990 to over 21% in recent years, exceeding the guidance recommended by the World Health Organization reference approximately 10%-15% for medically indicated procedures [4], [5]. This increase has been reported across both high-income and low- to middle-income countries, reflecting a combination of clinical indications, institutional practices, and non-medical factors influencing delivery decisions [1], [6]-[8]. Although cesarean delivery remains a critical life-saving intervention when appropriately indicated, its expanding utilization has contributed to a growing burden of postoperative care, particularly in the context of pain management [9]-[11].

Postoperative pain following cesarean section is a prevalent and clinically significant concern. Evidence indicates that inadequately controlled post-cesarean pain can delay physical recovery, impair early mobilization, prolong hospital stay, and negatively affect maternal functioning during the immediate postpartum period [12]–[16]. Moreover, unmanaged pain has been associated with reduced breastfeeding comfort, delayed mother–infant bonding, and increased psychological distress, including anxiety and depressive symptoms [17], [18]. These consequences underscore the importance of effective and safe pain relief strategies in post-cesarean treatment.

Current postoperative pain relief following cesarean delivery relies predominantly on pharmacological approaches, including opioid and non-opioid analgesics administered as part of multimodal analgesia protocols [19]–[24]. While these regimens are generally effective in reducing pain intensity, it causes various side effects such as pain, nausea and vomiting, and sedation, impaired maternal alertness, and concerns related to opioid exposure and dependence [25]–[29]. In addition, substantial variability exists in the implementation of multimodal analgesia across healthcare facilities, particularly between high-income and resource-limited settings, resulting in inconsistent analgesic effectiveness and unequal access to optimal pain control [30]–[33]. These limitations have prompted increasing interest in adjunctive, non-pharmacological strategies that can complement standard analgesic care without adding pharmacological burden.

Complementary non-pharmacological interventions, including relaxation techniques, music therapy, and hypnosis-based approaches, have been explored as adjuncts for postoperative pain management [34]–[37]. Among these, hypnotherapy has gained attention due to its proposed psychophysiological mechanisms, which include modulation of autonomic nervous system activity, attentional redirection, and cognitive reinterpretation of pain perception [34], [35], [38]. Neurophysiological studies suggest that hypnosis may influence pain processing by reducing sympathetic activation, enhancing parasympathetic responses, and engaging cortical pathways involved in pain modulation [21], [22]. These mechanisms provide a plausible theoretical basis for the application of hypnotherapy in postoperative pain contexts.

Despite this theoretical rationale, the empirical evidence supporting hypnotherapy for post-cesarean pain remains limited and methodologically heterogeneous. Existing primary studies are predominantly small-scale and single-center, with many employing quasi-experimental designs lacking randomization or blinding [38]–[40]. Even randomized controlled trials in this area remain scarce and often report short follow-up periods and limited protocol standardization [41]. Furthermore, considerable variation exists in the delivery of hypnotherapy interventions, including differences in timing (preoperative vs. postoperative), duration, facilitator training, and use of adjunctive techniques, complicating direct comparison across studies.

Although several findings from systematic reviews and meta-analyses have shown the effectiveness of hypnosis in reducing acute and chronic pain across diverse surgical and clinical populations [42]–[44], these reviews generally include heterogeneous patient groups and do not focus specifically on post-cesarean mothers. This is a critical limitation, as post-cesarean patients represent a distinct population with unique physiological, psychological, and caregiving demands during the postpartum period. Consequently, the applicability of broader hypnosis-related findings to post-cesarean pain management remains uncertain.

To date, no systematic review has specifically synthesized evidence on hypnotherapy as a complementary intervention for post-cesarean pain using a transparent and standardized methodological framework such as PRISMA. This represents a clear gap in the literature, particularly in light of increasing emphasis on opioid-sparing and multimodal pain management strategies in obstetric care [32], [33]. Addressing this gap is essential to clarify the current strength of evidence, identify methodological limitations, and inform future clinical practice and research.

Consequently, this study focused on conducting a PRISMA-based systematic review of studies published between 2015 and 2024 to evaluate the effectiveness of hypnotherapy in reducing postoperative pain among post-cesarean section patients. The review critically appraised study quality, intervention characteristics, and outcome measures reported in the included studies. Through this approach, the present review endeavors to deliver a structured and evidence-based synthesis to support the informed integration of hypnotherapy into post-cesarean pain management protocols where appropriate.

2. METHOD

2.1. Design of the study

This research adopted a systematic review approach that was carried out following the PRISMA reporting standards. The purpose of this review was to consolidate empirical evidence concerning hypnotherapy effectiveness as a complementary intervention for reducing postoperative pain among post-cesarean section patients. All methodological steps including literature searching, study selection, eligibility assessment, data extraction, and synthesis were predefined to ensure transparency and reproducibility.

2.2. Information sources

A comprehensive literature search was conducted using the following electronic databases: PubMed, Google Scholar, and the Open Journal System (OJS). PubMed was selected as the primary biomedical database to ensure inclusion of studies that have undergone peer review and indexed medical literature, while Google Scholar and OJS were used to capture regional and non-indexed journals that frequently publish nursing and complementary therapy studies relevant to the research topic. Searches were conducted for research articles released from January 2015 through December 2024.

2.3. Search strategy

A systematic search strategy was formulated by integrating Medical Subject Headings (MeSH) terms with free-text keywords, and Boolean operators (AND, OR) were applied consistently across databases. The core search terms included variations of hypnotherapy, cesarean section, and postoperative pain. The search strategy applied in PubMed was structured as follows: (“Hypnosis”[MeSH] OR hypnotherapy OR “clinical hypnosis”) AND (“Cesarean Section”[MeSH] OR cesarean OR caesarean OR “cesarean delivery”) AND (“postoperative pain” OR “post-surgical pain” OR pain). Filters applied in PubMed included: i) publication year: 2015-2024, ii) language: English or Indonesian, iii) species: humans, iv) document type: Journal articles. Equivalent keyword combinations and filters were reconciled for Google Scholar and OJS. Manual screening of reference lists from selected studies was performed to a reference management tool, and duplicate entries were removed before study selection.

2.4. Eligibility criteria

The criteria for study eligibility were developed following the PICO approach:

- i) Population (P): Women undergoing caesarean section
- ii) Intervention (I): Hypnotherapy or hypnosis-based interventions delivered preoperatively, intraoperatively, or postoperatively
- iii) Comparison (C): Standard postoperative care, routine analgesia, or non-hypnosis control interventions
- iv) Outcome (O): Postoperative pain intensity measured using validated measurement instruments, including the Visual Analog Scale (VAS) or Numerical Rating Scale (NRS)

2.4.1. Inclusion criteria

Inclusion was restricted to studies that satisfied all of the specified criteria:

- i) Released from 2015 through 2024
- ii) Peer-reviewed journal articles
- iii) Quantitative or mixed-methods studies reporting quantitative postoperative pain outcomes
- iv) Conducted specifically among post-cesarean section patients
- v) Evaluated hypnotherapy or hypnosis-based interventions as a distinct component
- vi) Available in full-text form in English or Indonesian

2.4.2. Exclusion criteria

Exclusion was applied to studies for the specific reasons outlined below:

- i) Population mismatch: Studies involving general surgical patients, vaginal delivery, or mixed obstetric populations without separate post-cesarean analysis
- ii) Intervention ambiguity: Studies in which hypnotherapy was combined with other mind-body interventions (e.g., acupuncture, music therapy) without isolating the effect of hypnotherapy
- iii) Outcome irrelevance: Articles that did not report postoperative pain outcomes or used non-validated pain measures
- iv) Document type: Case reports, qualitative studies, dissertations, theses, conference abstracts, editorials, or review articles
- v) Methodological incompleteness: Studies lacking full-text access or insufficient methodological detail to permit appraisal.

2.5. Study selection

The study selection process was carried out through three consecutive phases, including screening of titles, evaluation of abstracts, and assessment of full-text eligibility. At each phase, all retrieved records were independently reviewed by two reviewers. Any disagreements were addressed through discussion, and a third reviewer was involved when consensus could not be achieved. The overall selection procedure, along with reasons for exclusion at the full-text stage, was systematically recorded and illustrated using the PRISMA 2020 flow diagram.

2.6. Data extraction

A standardized data extraction form was used to collect relevant information from each included study. Extracted variables included author, year of publication, country, study design, sample size, characteristics of the hypnotherapy intervention (timing, duration, delivery method), comparator, pain measurement instruments, primary pain outcomes, secondary outcomes (e.g., anxiety), and reported limitations. Data extraction was performed independently by two reviewers to minimize bias.

2.7. Quality appraisal

Study quality was assessed using validated appraisal tools appropriate to the respective designs. The JBI checklist was applied to quasi-experimental studies, while RoB 2.0 was used for randomized controlled trials. Quality ratings guided result interpretation rather than determining study eligibility.

2.8. Data synthesis

Given the variability in study designs, intervention procedures, and outcome assessments, quantitative meta-analysis was deemed inappropriate. Consequently, a narrative synthesis method was adopted to integrate and compare the findings across the included studies. Results were grouped based on study design and intervention characteristics, and patterns in pain reduction outcomes were examined in relation to methodological quality.

3. RESULTS

The database search process resulted in the identification of 326 records, including 254 records from Google Scholar and 72 from PubMed. Following the screening of titles and abstracts, 51 records were excluded owing to irrelevance to the study objective. Assessment of full-text articles was conducted on 275 articles, of which 271 were excluded for clearly defined reasons, including non-post-cesarean populations, interventions not involving hypnotherapy, absence of postoperative pain outcomes, and document types such as dissertations, conference abstracts, or non-peer-reviewed publications. As a result, four studies satisfied all predefined inclusion criteria and were incorporated into the qualitative synthesis. An overview of the study selection procedure covering the stages of identification, screening, eligibility assessment, and final inclusion is presented in the PRISMA 2020 flow diagram as shown in Figure 1.

Although the literature search covered studies released from 2015 through 2024, only four studies published between 2021 and 2024 known all predefined specified eligibility criteria and were included in the narrative synthesis. Sample sizes ranged from 24 to 80 post-cesarean section patients. Three studies employed quasi-experimental designs, while one study used a randomized controlled trial design. Across all studies, postoperative the intensity of pain was quantified using validated instruments, predominantly NRS. Hypnotherapy interventions varied in structure and delivery, ranging from structured therapist-guided verbal suggestion and relaxation techniques to combined approaches incorporating self-hypnosis audio. One study implemented a hypnosis-based intervention alongside acupressure, which was acknowledged as a limitation due to the difficulty of isolating the independent effect of hypnotherapy. Control groups across studies received standard postoperative care or routine analgesic management without hypnosis-based intervention. A thorough summary of study attributes, interventions, and outcomes is carried in Table 1.

Despite heterogeneity in study designs and intervention protocols, all included studies consistently reported a reduction in postoperative pain intensity among post-cesarean mothers who received hypnotherapy compared with those receiving standard care alone. Quasi-experimental studies demonstrated greater pre-post reductions in pain scores in the hypnotherapy groups than in control groups, while the randomized controlled trial reported statistically significant differences favoring hypnotherapy. Although absolute pain score values varied between studies, the direction of effect was uniform, indicating a consistent analgesic pattern associated with hypnosis-based interventions.

A notable pattern observed across studies was that hypnotherapy appeared to be most effective when administered during the early postoperative period, particularly within the first 24–48 hours after cesarean delivery. Studies utilizing structured verbal suggestion and guided relaxation techniques tended to report more pronounced pain reductions than those employing less standardized or combined modalities. In addition to pain reduction, two studies reported secondary outcomes such as decreased anxiety and improved psychological comfort, suggesting that hypnotherapy may influence both sensory and affective components of postoperative pain. However, interpretation of these findings must consider the methodological limitations present across studies, including small sample sizes, limited use of randomization or blinding, and short follow-up durations.

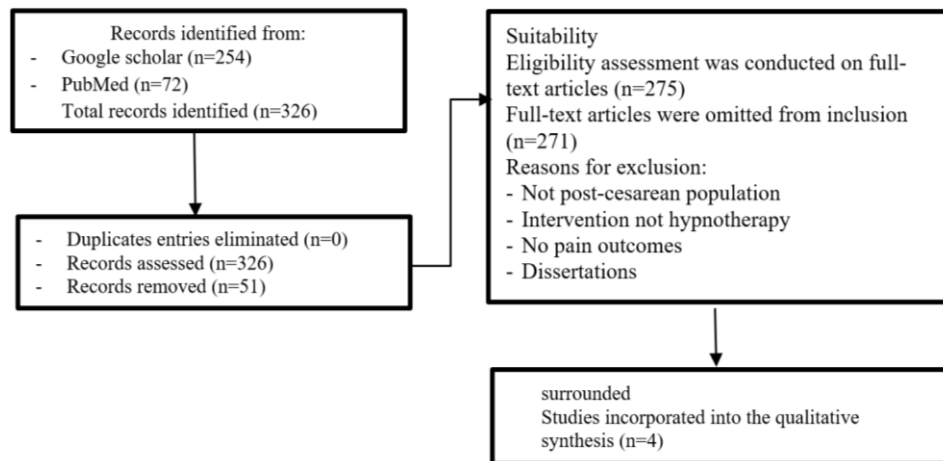


Figure 1. Article was obtained from Google Scholar and PubMed

Table 1. Summary of the findings

No	Author, Year, Title	Population (P)	Intervention (I)	Comparison/ Control (C)	Outcome (O)	Study design	Limitations
1	K. Suhaemi, E. Purwani Sari, and D. Winda [38], Hypnotherapy on pain among post-cesarean section mothers at PMC hospital	24 post-cesarean patients on day 2	A combination of hypnotherapy and analgesics, verbal suggestions used during the conscious state to promote relaxation	Analgesic administration only (no hypnotherapy)	Significant pain reduction in the intervention group (mean NRS: 2.20 to 0.56; $p = 0.000$) vs. the control group (mean NRS dropped to 1.20; $p = 0.007$)	Quasy-experimental (pretest-posttest non-equivalent control group)	Small sample size ($n = 24$), no randomization, lack of blinding, short follow-up duration, minimal bias control
2	Asyima and I. A. Wulandari [39], The use of hypnotherapy to reduce pain in post-cesarean mothers	30 post-cesarean patients (days 2-3), aged 20-35, without complications	Individual hypnotherapy (20-30 minutes) in a calm environment through three phases: preparation, implementation, and closing, using verbal suggestions to reduce pain perception	Routine port operative care without hypnotherapy	The hypnotherapy group had significantly lower mean pain scores (2.47 vs. 3.67; $p = 0.000$), confirming effectiveness in reducing post-cesarean pain	Quasy-experimental (pretest-posttest two groups)	Small sample size ($n = 30$), no randomization, no blinding, single-center intervention, subjective NRS measurement without physiological assessment
3	A. H. Mahandaru, S. H. Respati, S. Sulistyowati, A. Laqif, and H. Prasetya [41], The effect of hypnotherapy on postpartum pain and depression in women with post caesarean delivery	80 post-cesarean mothers (40 I/40 C)	Hypnotherapy sessions + self-hypnosis audio	Standard postpartum care	Significant pain reduction (NRS 4.58→lower vs control 6.48; $p < 0.001$)	Randomized controlled trial	Possible performance bias; unclear allocation concealment; no long-term follow-up
4	D. E. Anuhgera, T. Kuncoro, S. Sumarni, M. Mardiyono, and A. Suwondo [40], Effect of Combination of hypno-breastfeeding and acupressure on anxiety and wound pain in post-cesarean mothers	Post-CS mothers (sample size 40-60)	Hypno-breastfeeding (hypnosis-based relaxation) + acupressure	Standard care	Significant reduction in anxiety and wound pain	Quasi-experimental	Multi-modality intervention makes it had to isolate effect of hypnotherapy; risk of bias

4. DISCUSSION

4.1. Interpretation of findings

The current systematic review indicates that hypnotherapy, when applied as a complementary intervention, is consistently associated with reduced postoperative pain intensity among women undergoing cesarean section. Although variation in study design was observed among the included studies, intervention format and size of study population, the direction of effect was uniform, with all studies reporting lower pain scores in hypnotherapy groups compared to standard care alone. This consistency suggests that hypnosis-based interventions may contribute to postoperative pain modulation, particularly during the early recovery period. However, given the predominance of quasi-experimental designs and limited sample sizes, these findings should be interpreted as indicative rather than confirmatory of causal effectiveness.

The observed pain reduction may reflect the influence of hypnotherapy on both sensory and affective dimensions of pain perception. Several studies included in this review reported concurrent reductions in anxiety or psychological discomfort, supporting the interpretation that hypnotherapy may alter pain experience through cognitive and emotional pathways rather than direct physiological analgesia. Nevertheless, the heterogeneity of intervention protocols and outcome timing prevents definitive conclusions regarding optimal dosage, duration, or delivery mode of hypnotherapy.

Evidence synthesized in this review shows that broadly similar to prior research demonstrating the potential role of hypnosis in postoperative and procedural pain management. Prior studies have reported that hypnosis-based interventions can reduce perceived pain intensity, anxiety, and analgesic consumption across various surgical contexts, supporting the plausibility of hypnotherapy as an adjunct to conventional pain management strategies [45]-[47]. The consistency observed in post-cesarean populations aligns with these broader findings, suggesting that the analgesic benefits of hypnotherapy may extend across different surgical procedures.

However, compared with earlier literature, the present review highlights persistent methodological limitations in hypnotherapy research within obstetric settings. Similar to concerns raised in previous reviews, many included studies lacked randomization, blinding, and prolonged follow-up [48]. These confounders restrict the strength of evidence and complicate comparisons across studies. Moreover, the variation in intervention components such as therapist-guided hypnosis, self-hypnosis, or combined complementary techniques reflects ongoing inconsistency in how hypnotherapy is operationalized in clinical research, a challenge also noted in prior systematic reviews [49].

4.2. Clinical and research implications

Considering clinical practice, the findings demonstrate that hypnotherapy may serve as a feasible complementary approach to postoperative pain management following cesarean section, particularly in settings where non-pharmacological interventions are encouraged to reduce reliance on analgesic medications. Hypnotherapy interventions described in the included studies were generally low-risk and could be integrated into perioperative care with appropriate training and standardization. However, the current evidence base does not support hypnotherapy as a replacement for standard analgesic protocols, but rather as an adjunct that may enhance patient comfort and psychological well-being.

For researchers, these findings underscore the need for improved methodological rigor in future studies. Standardized intervention protocols, consistent outcome measures, and clearly defined comparator conditions are necessary to strengthen evidence synthesis and enable meta-analytic approaches. Addressing these issues would improve the interpretability and clinical applicability of hypnotherapy research in obstetric pain management.

4.3. Directions for future research

Future research should prioritize rigorously designed randomized controlled trials with adequate size of population to clarify the effectiveness of hypnotherapy in post-cesarean pain management. Studies should clearly define hypnotherapy protocols, including session timing, duration, and delivery method, to enhance reproducibility. Additionally, extended follow-up durations are required to evaluate whether the observed pain reduction persists beyond the immediate postoperative phase.

Further investigation into secondary outcomes, such as anxiety, patient satisfaction, and analgesic consumption, may enable a more comprehensive insight into the multidimensional effects of hypnotherapy. Exploring implementation feasibility in diverse clinical settings, including low-resource environments, would also contribute to the practical relevance of future findings. These research directions would help advance hypnotherapy from an emerging complementary approach toward a more robustly evidenced component of postoperative care.

5. CONCLUSION

This PRISMA-based systematic review of research released during the 2015-2024 period indicates that hypnotherapy, when used as a complementary intervention, is consistently associated with reduced postoperative pain intensity following cesarean section. Although the strength of the evidence is restricted by limited sample sizes and the predominance of quasi-experimental designs, the uniform direction of findings across included studies suggests that hypnotherapy may support conventional analgesic strategies during early postoperative recovery. From a clinical perspective, hypnotherapy may be considered as an adjunctive, non-pharmacological intervention, particularly within the first 24–48 hours after cesarean delivery, and should be delivered using structured protocols by trained personnel. Its implementation should complement rather than replace standard postoperative analgesia and be guided by patient preference, clinical feasibility, and institutional resources. Additional rigorously designed randomized controlled trials are needed to enhance the evidence base and support more conclusive clinical recommendations.

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AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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C : **C**onceptualization

M : **M**ethodology

So : **S**oftware

Va : **V**alidation

Fo : **F**ormal analysis

I : **I**nterpretation

R : **R**esources

D : **D**ata Curation

O : **O**riginal Draft

E : **E**diting

Vi : **V**isualization

Su : **S**upervision

P : **P**roject administration

Fu : **F**unding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

ETHICAL APPROVAL

Approval from an ethics committee was not needed for this research because it entailed secondary analysis of existing data of previously proclaimed research. Nevertheless, the review adhered to academic integrity standards by accurately citing all sources, ensuring transparency in reporting, and upholding the principles outlined in the PRISMA 2020 guideline.

DATA AVAILABILITY

All data analyzed in this study were obtained from publicly available journal articles accessible through Google Scholar and the Open Journal System (OJS).

REFERENCES

- [1] A. P. Betran, J. Ye, A. B. Moller, J. P. Souza, and J. Zhang, "Trends and projections of caesarean section rates: global and regional estimates," *BMJ Global Health*, vol. 6, no. 6, p. e005671, Jun. 2021, doi: 10.1136/bmjgh-2021-005671.
- [2] S. Nagy and Z. Papp, "Global approach of the cesarean section rates," *Journal of Perinatal Medicine*, vol. 49, no. 1, pp. 1–4, 2020, doi: 10.1515/jpm-2020-0463.
- [3] C. M. Angolile, B. L. Max, J. Mushemba, And H. L. Mashauri, "Global increased cesarean section rates and public health implications: a call to action," *Health Science Reports*, vol. 6, no. 5, May 2023, doi: 10.1002/hsr2.1274.
- [4] WHO, "Caesarean section rates continue to rise, amid growing inequalities in access" 2021. [online]. available: <https://www.who.int/news/item/16-06-2021-caesarean-section-rates-continue-to-rise-amid-growing-inequalities-in-access>
- [5] A. T. Habteyes, M. D. Mekuria, H. A. Negeri, R. T. Kassa, L. K. Deribe, And E. G. Sendo, "Prevalence and associated factors of caesarean section among mothers who gave birth across eastern African countries: systematic review and meta-analysis study," *Heliyon*, vol. 10, no. 12, p. e32511, 2024, doi: 10.1016/j.heliyon.2024.e32511.
- [6] V. Verma, R. K. Vishwakarma, D. C. Nath, H. T. A. Khan, R. Prakash, and O. Abid, "Prevalence and determinants of caesarean section in south and south-east asian women," *Plos One*, vol. 15, no. 3, pp. 1–15, 2020, doi: 10.1371/journal.pone.0229906.
- [7] F. Karim *et al.*, "Prevalence and factors associated with caesarean section in four hard-to-reach areas of Bangladesh: findings from a cross-sectional survey," *Plos One*, vol. 15, no. 6, pp. 1–16, 2020, doi: 10.1371/journal.pone.0234249.
- [8] G. Gedefaw, A. Demis, B. Alemnew, A. Wondmieni, A. Getie, and F. Waltengus, "Prevalence, indications, and outcomes of caesarean section deliveries in ethiopia: a systematic review and meta-analysis," *Patient Safety in Surgery*, vol. 14, no. 1, 2020, doi: 10.1186/s13037-020-00236-8.
- [9] C. Antoine and B. K. Young, "Cesarean section one hundred years 1920-2020: the good, the bad and the ugly," *Journal of Perinatal Medicine*, vol. 49, no. 1, pp. 5–16, 2020, doi: 10.1515/jpm-2020-0305.
- [10] B. C. Demilew, N. Zurbachew, N. Getachew, G. Mekete, and D. T. Lema, "Prevalence and associated factors of postoperative acute pain for mothers who gave birth with cesarean section: a systematic review and meta-analysis," *Pain Management Nursing*, vol. 25, no. 6, pp. e452–e464, 2024, doi: 10.1016/j.pmn.2024.05.010.
- [11] M. Mostafa, A. Hasanin, and M. Elsayad, "Post-cesarean delivery pain management," *Pain Management*, vol. 15, no. 9, pp. 611–619, 2025, doi: 10.1080/17581869.2025.2533104.
- [12] E. Jenabi, S. Khazaei, S. Bashirian, S. Aghababaei, and N. Matinnia, "Reasons for elective cesarean section on maternal request: a systematic review," *Journal of Maternal-Fetal and Neonatal Medicine*, vol. 33, no. 22, pp. 3867–3872, 2020, doi: 10.1080/14767058.2019.1587407.
- [13] S. Ostafichuk, N. Drohomiretska, O. Kusa, O. Zhukuliak, O. Neiko, and T. Kotyk, "Effectiveness of physiotherapy on pain relief and functional recovery post-cesarean section," *Ceska Gynekologie*, vol. 90, no. 3, pp. 204–211, 2025, doi: 10.48095/ccg2025204.
- [14] V. Mayoral Rojals, M. Charaja, O. De Leon Casasola, A. Montero, M. A. Narvaez Tamayo, and G. Varrassi, "New insights into the pharmacological management of postoperative pain: a narrative review," *Cureus*, vol. 14, no. 3, pp. 1–11, 2022, doi: 10.7759/cureus.23037.
- [15] E. Ismawati and E. Adimayanti, "Pengelolaan gangguan mobilitas fisik melalui mobilisasi dini ibu post-partum sectio saesarea (sc) di RSUD dr. Gunawan Mangunkusumo Ambarawa," *Jurnal Ilmiah Nusantara (Jinu)*, vol. 2, no. 6, pp. 868–875, 2025, doi: 10.61722/jinu.v2i6.6364.
- [16] A. V. Arunita, H. Setyowati, E. Rahayu, K. Wijayanti, and U. M. Magelang, "Section: maternity nursing," *International Conference on Advanced Nursing Care*, vol. 2, no. 1, 2024.
- [17] E. Roofthoof *et al.*, "Prospect guideline for elective caesarean section: updated systematic review and procedure-specific postoperative pain management recommendations," *Anaesthesia*, vol. 76, no. 5, pp. 665–680, 2021, doi: 10.1111/anae.15339.
- [18] E. Veef and M. Van De Velde, "Post-cesarean section analgesia," *Best Practice and Research: Clinical Anaesthesiology*, vol. 36, no. 1, pp. 83–88, May 2022, doi: 10.1016/j.bpa.2022.02.006.
- [19] E. Niyonkuru, M. A. Iqbal, X. Zhang, and P. Ma, "Complementary approaches to postoperative pain management: a review of non-pharmacological interventions," *Pain and Therapy*, vol. 14, no. 1, pp. 121–144, Feb. 2025, doi: 10.1007/s40122-024-00688-1.
- [20] M. Giacon, S. Cargnin, M. Talmon, and S. Terrazzino, "Pharmacogenetics of opioid medications for relief of labor pain and post-cesarean pain: a systematic review and meta-analysis," *European Journal of Clinical Pharmacology*, vol. 81, no. 3, pp. 403–417, 2025, doi: 10.1007/s00228-024-03798-z.
- [21] C. K. Cheung, J. O. Adeola, S. S. Beutler, and R. D. Urman, "Postoperative pain management in enhanced recovery pathways," *Journal of Pain Research*, vol. 15, pp. 123–135, 2022, doi: 10.2147/JPR.S231774.
- [22] X. Luo, P. G. Rao, X. H. Lei, W. W. Yang, B. Z. Liao, and R. Guo, "Opioid-free strategies for patient-controlled intravenous postoperative analgesia: a review of recent studies," *Frontiers in Pharmacology*, vol. 15, no. 10, pp. 1–9, 2024, doi: 10.3389/fphar.2024.1454112.
- [23] N. M. Alorfi, "Pharmacological methods of pain management: narrative review of medication used," *International Journal of General Medicine*, vol. 16, pp. 3247–3256, 2023, doi: 10.2147/ijgm.s419239.
- [24] D. Podder, O. Stala, R. Hirani, A. M. Karp, and M. Etienne, "Comprehensive approaches to pain management in postoperative spinal surgery patients: advanced strategies and future directions," *Neurology International*, vol. 17, no. 6, 2025, doi: 10.3390/neurolint17060094.
- [25] B. Y. Kidanemariam, T. Elsholz, L. L. Simel, E. H. Tesfamariam, and Y. M. Andemeskel, "Utilization of non-pharmacological methods and the perceived barriers for adult postoperative pain management by the nurses at selected national hospitals in Asmara, Eritrea," *BMC Nursing*, vol. 19, no. 1, 2020, doi: 10.1186/s12912-020-00492-0.
- [26] X. Chen *et al.*, "Clinical practice guidelines for postoperative pain management in adults (2024 edition)," *Journal of Anesthesia and Translational Medicine*, vol. 4, no. 3, pp. 161–185, 2025, doi: 10.1016/j.jatmed.2025.09.001.
- [27] S. Hailu, S. Mekonen, and A. Shiferaw, "Prevention and management of postoperative nausea and vomiting after cesarean section: a systematic literature review," *Annals of Medicine and Surgery*, vol. 75, 2022, doi: 10.1016/j.amsu.2022.103433.
- [28] B. Ponappan *et al.*, "Efficacy of non-opioid analgesics in the management of postoperative pain after major abdominal surgery: a comprehensive review and meta-analysis of randomized controlled trials," *Cureus*, 2025, doi: 10.7759/cureus.86157.
- [29] S. M. H. Hasan, M. G. Murshid, S. S. Ashrafi, and M. S. A. Somrat, "Non-opioid rectal suppositories in post cesarean delivery pain management," *Scholars Journal of Applied Medical Sciences*, vol. 12, no. 11, pp. 1670–1676, 2024, doi: 10.36347/sjams.2024.v12i11.038.
- [30] M. Mayle, "Multimodal pain regimens for postoperative pain management," *Lynchburg Journal of Medical Science*, vol. 1, no. 1, 2025, doi: 10.63932/3067-7106.1009.
- [31] J. X. C. Ke *et al.*, "Healthcare delivery gaps in pain management within the first 3 months after discharge from inpatient noncardiac surgeries: a scoping review," *British Journal of Anaesthesia*, vol. 131, no. 5, pp. 925–936, 2023, doi: 10.1016/j.bja.2023.08.006.

- [32] K. T. Forkin *et al.*, "Impact of timing of multimodal analgesia in enhanced recovery after cesarean delivery protocols on postoperative opioids: a single center before-and-after study," *Journal of Clinical Anesthesia*, vol. 80, 2022, doi: 10.1016/j.jclinane.2022.110847.
- [33] W. D. Agastya and A. Rahmadinie, "Opioid-sparing and multimodal analgesia in cesarean delivery: a systematic review of evidence and implementation across high and low-middle income countries," *Journal of Diverse Medical Research: Medicosphere*, vol. 2, no. 9, pp. 440–453, 2025, doi: 10.33005/jdiversemedres.v2i9.214.
- [34] G. De Benedittis, "Hypnotic modulation of autonomic nervous system (ANS) activity," *Brain Sciences*, vol. 14, no. 3, 2024, doi: 10.3390/brainsci14030249.
- [35] G. De Benedittis, "Brain mechanisms of hypnosis," *Brain Sciences*, vol. 15, no. 2, 2025, doi: 10.3390/brainsci15020142.
- [36] S. Ramadhan, D. Irawati, R. Maria, and L. Arista, "Efektivitas hipnoterapi dalam manajemen nyeri pada gangguan muskuloskeletal," *Journal of Telenursing (JOTING)*, vol. 6, no. 1, pp. 1519–1526, Jun. 2024, doi: 10.31539/joting.v6i1.10043.
- [37] V. De Pascalis and G. De Benedittis, "Experimental pain modulation via hypnosis: neurophysiological perspectives," *International Review of Neurobiology*, vol. 184, pp. 83–127, 2025, doi: 10.1016/bs.im.2025.08.002.
- [38] K. Suheimi, E. P. Sari, and D. Winda, "Pengaruh hypnotherapy terhadap nyeri pada ibu post sectio caesarea di RS PMC," *Jurnal Pendidikan Kesehatan*, pp. 84–90, 2024.
- [39] A. Asyima and I. A. Wulandari, "Penggunaan hipnoterapi untuk menurunkan nyeri pada ibu post seksio sesarea," *Holistik Jurnal Kesehatan*, vol. 15, no. 1, pp. 110–116, 2021, doi: 10.33024/hjk.v15i1.4176.
- [40] D. E. Anuhgera, T. Kuncoro, S. Sumarni, M. Mardiyono, and A. Suwondo, "Effect of combination of hypnobreastfeeding and acupressure on anxiety and wound pain in post-caesarean mothers," *Belitung Nursing Journal*, vol. 3, no. 5, pp. 525–532, 2017, doi: 10.33546/bnj.191.
- [41] A. H. Mahandaru, S. H. Respati, S. Sulistyowati, A. Laqif, and H. Prasetya, "The effect of hypnotherapy on postpartum pain and depression in women with post-caesarean delivery," *Indonesian Journal of Medicine*, vol. 6, no. 2, pp. 194–205, 2021, doi: 10.26911/theijmed.v6i2.395.
- [42] A. Yezhan, A. Ayazbekova, D. R. Lavage, and J. E. Chelly, "The use of medical hypnosis to prevent and treat acute and chronic pain: a systematic review and meta-analysis," *Journal of Clinical Medicine*, vol. 14, no. 13, 2025, doi: 10.3390/JCM14134661.
- [43] H. G. Jones *et al.*, "Adjunctive use of hypnosis for clinical pain: a systematic review and meta-analysis," *Pain Reports*, vol. 9, no. 5, p. e1185, 2024, doi: 10.1097/PR9.0000000000001185.
- [44] L. S. Milling, K. E. Valentine, L. M. LoStimolo, A. M. Nett, and H. S. McCarley, "Hypnosis and the alleviation of clinical pain: a comprehensive meta-analysis," *International Journal of Clinical and Experimental Hypnosis*, vol. 69, no. 3, pp. 297–322, 2021, doi: 10.1080/00207144.2021.1920330.
- [45] A. R. Hunter, A. Heiderscheit, M. Galbally, D. Gravina, H. Mutwalli, and H. Himmerich, "The effects of music-based interventions for pain and anxiety management during vaginal labour and caesarean delivery: a systematic review and narrative synthesis of randomised controlled trials," *International Journal of Environmental Research and Public Health*, vol. 20, no. 23, 2023, doi: 10.3390/ijerph20237120.
- [46] A. Retni, F. A. Lihu, and I. D. Yunus, "The effect of Benson's relaxation technique on pain reduction in post-operative cesarean section patients in the postpartum care room At RSUD Dr. M.M Dunda," *Jurnal EduHealth*, vol. 15, no. 04, pp. 609–620, 2024.
- [47] Y. Sulistiawati, J. P. Make, I. Primadevi, and L. Puspita, "Pengaruh teknik relaksasi Benson terhadap skala nyeri pasien post sectio caesarea di RSIA Mutiara Putri Bandar Lampung tahun 2024," *Jurnal Kesehatan Tambusai*, vol. 6, no. 2, pp. 4212–4222, May 2025, doi: 10.31004/jkt.v6i2.38566.
- [48] F. S. Muqorrobin, I. Subekti, T. Nataliswati, P. Kesehatan, and K. Malang, "Perbedaan tingkat nyeri intervensi pemberian guided imagery in post-operative caesarean section patients," *Jurnal Keperawatan Terapan (e-Journal)*, vol. 11, no. 1, pp. 87–95, 2025.
- [49] A. R. Mustafa and P. Anisa, "Effectiveness of benson relaxation technique on pain intensity in post sectio caesarea patients at Selaras Hospital, Tangerang, in 2023," *Hearty*, vol. 13, no. 1, pp. 123–133, 2025, doi: 10.32832/hearty.v13i1.16002.

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